PRELIMINARY STUDY ON MEAT QUALITY OF YUSHAN BLACK PIG

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Introduction

Yushan Black Pig, a Chinese indigenous pig breed, is well-known for its excellent characteristics of thin skin, tiny bone, tender meat, delicious and special flavor. This study comprehensively measured the systematic parameters of meat quality and supplied scientific evidences for better conservation, exploitation and utilization of this special pig breed.

Materials and methods

Meat samples: 10 castrated pure blood Yushan Black pigs were randomly selected for meat parameters measurement at the age of 7 months with ≥75kg body weight.

Meat pH: Meat pH was measured by Testo205 pH meter according to the method described by W.L. Zhang (2002).

Meat Color Evaluation: Meat color was evaluated by American NPCC color standard (1991) and CR10 Colorimeter as described by W.L. Zhang (2002)

Meat Marbling: Meat marbling was measured by American NPCC color standard (1991) as described by W.L. Zhang (2002)

Meat Storage Loss: Meat storage loss was measured according to the method of NY/T821-2004 Pig Meat Quality Measurement Criteria.

Cooking Loss and Napole Yield: Cooking loss and Napole yield were calculated by the method described by W.L. Zhang (2002).

Meat Tenderness: Meat tenderness was measured by C-LM3 tenderometer according to Chen (2003)

Meat Histological Measurement: Histological measurement was done as described by W.L. Zhang (2002) Following analysis was done in the middle section of LD muscle

Water, Protein and Fat were measured according to GB/T9695.15-1988、GB/T9695.3-2003、GB/T9695.7-1988 standard methods.

Inosinic Acid content was determined by HPLC (waters 2690-996 Alliance) according to Y.Y. Wu and F.Y. Li (2005)

SOD content was assayed according to SOD kit instruction (Nanjing, China)

Amino acid was analyzed by L8800 (Hitachi amino acid auto analyzer.)

All data are presented as means ±SD.

Results and discussion

The parameters of meat quality of Yu-shan Black pig were shown on table 1.

Table 1. Results of meat quality parameters of Yushan Black pigs

Traits	Measured value	Traits	Measured value
Water (%)	68.39±2.76	L*(lightness)	55.39±3.14
Protein (%)	21.52±1.12	a*(redness)	7.24±2.43
Fat (%)	7.41±0.13	S(saturation degree)	9.75±0.38
Inosinic acid (mg/g)	2.01±0.21	Storage loss (%)	4.46±1.33
SOD(U/ mg prot)	19.72±3.37	Cooking loss (%)	30.32±3.85
pH_1	6.56±0.21	Napole yield (%)	63.99±3.20
pH_u	6.07±0.22	Tenderness $_{72h}$(N)	33.25±9.00
Color score	3.42±0.13	Muscle fiber diameter (μm)	44.33±6.26
marbling	3.90±0.18	Muscle fiber density (piece/mm^2)	407.55±43.83

From the results in table 1, we can conclude that:

1.The meat of Yushan Black pig breed has less water content and more dry weight, it shows higher level than some foreign pig breeds in intramuscular fat, inosinic acid content and SOD activity. These data could explain for the special deliciousness and flavor, stronger antioxidation and longer storage period.

2.With rich marbling the meat pH value and color score of Yushan Black pig are among the best. The S value

(saturation degree) reaches 9.75, similar to Dahe (10.14) and Duroc (8.51). The smaller a* value maybe was induced by the reflection of abundant meat marbling. This result demonstrates, to some extent, that the pH value, color score and marbling of Yushan Black are close to that of Dahe, but better than that of Duroc.

3.The less shear force and finer muscle fiber of Yunshan Black pig reveals its tenderness and fineness as well as its speciality for Chinese cuisine.

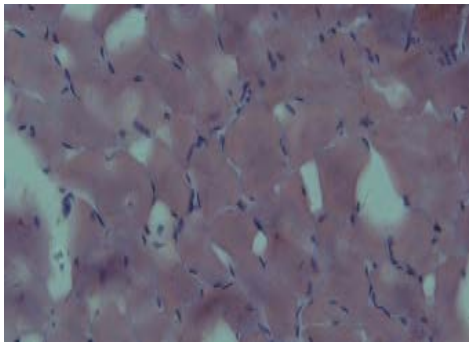

Figure 1. The transverse section of the *muscular tissue* (LEICA microscope 200X)

Amino acid contents were shown on table 2.

Table 2. Amino acid in Yushan Black's meat

Amino acid（%）	Value (mean±SD)	Amino acid（%）	Value (mean±SD)
Asp*	8.78±0.23	Ile**	3.90±0.15
Thr**	4.27±0.10	Leu**	6.85±0.21
Ser	3.65±0.09	Tyr	2.71±0.12
Glu*	14.44±0.43	Phe**	3.38±0.13
Pro	2.79±0.08	Lys**	7.36±0.32
Gly *	3.97±0.12	His	4.31±0.19
Ala*	5.17±0.12	Trp	0.54±0.02
Cys	0.53±0.06	Arg	4.77±0.31
Val**	4.32±0.17	Total EAA	32.63
Met**	2.55±0.08	Total FAA	32.36

Note: *: flavor amino acids (FAA), **: essential amino acids (EAA)

From table 2, *FAA and EAA* in Yushan Black's meat are obviously higher than Dahe (29.99%、27.87%) and Duroc (32.47%、29.22%). These data demonstrate that Yushan Black has richer nutrition and more delicious flavors.

Conclusion

Yushan Black pig breed has excellent meat qualities with its meat tenderness and fineness, juicy and fresh flavor together with its strong anti-oxidants and long storage time. Its high level of EAA, FAA and Inosinic acid distinguish itself for its richer nutrition and special flavor. Yushan Black pig has the great potential of development and utilization for the production of high grade meat.

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